Nonnegative solutions to the reaction-diffusion equations for prey-predator models with the dormancy of predators

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Abstract

The time-global unique solvability on the reaction–diffusion equations for preypredator models and dormancy on predators is established. The crucial step is to construct time-local nonnegative classical solutions by using a new approximation associated with time-evolution operators. Although the system does not equip usual comparison principles, a priori bounds are derived, so solutions are extended time-globally. Via observations to the corresponding ordinary differential equations, invariant regions and asymptotic behaviors of solutions are also investigated.

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